



RECEPTIVE AND EXPRESSIVE SEMANTIC SKILLS IN CHILDREN WITH DOWN SYNDROME

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ABSTRACT

Research has shown that there is a distinct delay in the linguistic area, including semantics, affecting both receptive and expressive language skills in Down syndrome (DS). This paper presents the results of an experiment conducted in order to investigate expressive and receptive semantic skills in ten children with DS and ten children with typical development (TD). For this purpose, two tasks that measure expressive and receptive vocabulary, subscales of a test standardized for the Greek population, were given to both groups. Our results showed that both receptive and expressive semantic skills of children with DS were poorer than those of their typically developing counterparts and the performance in expressive semantics was correlated with that in receptive semantics in the DS group. However, when expressive semantics were compared to receptive semantics in DS they were found to be statistically significant poorer, delineating the deficits that exist in the expressive domain of language in DS.

KEY WORDS: expressive and receptive semantics, Down syndrome.

1. INTRODUCTION

Down syndrome (DS) is a genetically based neurodevelopmental disorder characterised by a delay in language development that is greater than would be predicted by the individual's general cognitive delays (Vicari, Caselli & Tonucci, 2000). The extent of the delay also increases as children grow older. Moreover, language abilities for this group are not uniform but people with DS show a specific dissociation between different linguistic domains (i.e., better) and subdomains (e.g., better lexical than morphosyntactic abilities) (Berglund, Eriksson & Johansson, 2001; Caselli, Bates, Casadio, Fenson, Fenson, Sanders & Weir, 1995; Caselli, Vicari & Longobardi, 1998; Fowler, 1990). Semantics is also a domain of deficit in DS. Despite considerable individual variability, the onset of the first spoken word is often delayed, and early expressive vocabulary growth is slow for children with Down Syndrome (Berglund, Eriksson & Johansson, 2001; Mervis & Byron, 2000).

Receptive language or comprehension has been repeatedly studied in relation to expressive vocabulary (Chapman, Schwartz & Kay-Raining Bird, 1991) and comprehension skills have been found more advanced than expressive ones during all age periods up to adolescence in DS (Chapman, 2006; Facon, Facon-Bollengier & Grubar, 2002).

However, there is evidence that language comprehension may decline with age as individuals with DS enter adulthood (Chapman, Hesketh & Kistler, 2002). This may be related to whether, in the task that assesses comprehension, auditory short-term memory is involved, which is known to be affected in individuals with DS, or long-term memory. In either way, memory seems to be enhanced when visually or auditory information is being used and so does language comprehension (Toms, Morris & Foley, 1994). Similar to the pattern of expressive vocabulary development in typically developing children, some children with Down Syndrome experience a vocabulary spurt (Berglund, Eriksson & Johansson, 2004; Miller, 1998) though this spurt appears to occur at more advanced mental ages for children with Down Syndrome than for typically developing children (Miller, 1998).

In addition, more recent findings in the semantics domain in DS, using the fast mapping technique, which is described as a cognitive strategy that allows children to produce as many words as they can from a certain grammatical category, have shown that children with DS exhibit difficulties in producing a great number of words of all categories and especially verbs (Nash & Snowling, 2008).

Some evidence suggests that the productive vocabularies of adolescents with Down syndrome are similar to those of younger typically developing children matched for nonverbal mental age (Laws & Bishop, 2003). Still, children with Down syndrome scored lower than mental age-matched typically developing children on standardized assessments of expressive vocabulary in several studies (Caselli, Monaco, Trasciani, & Vicari, 2008; Hick, Botting & Ramsden, 2005; Roberts, Price & Malkin, 2007). Additionally, researchers have found that children and adolescents with Down syndrome (ages 5-20 years) produced fewer total and a smaller number of different words during connected speech (conversation and narration) than nonverbal mental age-matched typically developing children (Chapman, Seung, Schwartz & Kay-Raining Bird, 1998). In summary, most evidence suggests that expressive vocabulary is delayed beyond expectations for mental age in young individuals with Down syndrome.

In view of the above, the aim of the present study was a) to investigate semantic processing in children with DS and compare it with that of typically developing (TD) children b) to investigate whether receptive semantics were correlated with expressive ones in the DS group and c) to compare expressive skills with receptive ones in the semantic domain in the DS group.

2. METHOD

The participants of the study were 10 children with DS and 10 children with TD, aged from 4 to 7.11 years old. All children with Down syndrome had typical trisomy 21 and mild mental retardation. The mental age of the participants with DS was based on the results of WISC-III (Georgas, Paraskevopoulos, Bezevegis & Giannitsas, 1997) that was given to them prior to the participation in the study, at Public Diagnostic Centers (KEEDY). According to the results of WISC-III, their mental age varied from 42 months to 77 months. Two tasks, that measure semantic processing, which were subscales of a test (Tzouriadou, Singilitou, Anagnostopoulou & Vakola, 2008) standardized in Greek for children from 4 to 7.11 years old, were given to all children in order to examine a) receptive vocabulary b) expressive vocabulary.

The statistical analyses followed were a) *Cronbach's alpha reliability analysis* was used in order to show if all items were suitable for this measurement b) *One way multivariate analysis of variance (MANOVA)* was used in order to find if the independent variables (children with DS or with TD) affect the dependent variables (semantic tasks) c) *Correlation analysis* was used in order to reveal potential correlations between the variables (the 2 semantic tasks) d) *ANOVA for repeated measures* was used in order to find whether there is a dominance of receptive over expressive tasks in DS.

3. RESULTS

Cronbach's alpha showed that all items were suitable for this measurement (.792)

Statistically significant differences were found between the two groups on the dependent measures (Wilks' $\Lambda = .19$, $F_{2,10}=37.62$, $p<.001$). The following univariate tests were significant indicating statistically significant differences between the two groups in the receptive vocabulary [DS:16.36, TD: 83.21, $F_{1,18}=35.24$, $p<.001$] and expressive vocabulary (DS:16.37, TD:80.12, F (df 1,18)=152.45, $p<.001$). Children with DS gave fewer correct answers than children with TD in both semantic tasks.

The *Correlation analysis* showed a high correlation between the subscales (receptive and expressive vocabulary (.875).

The results from *ANOVA for repeated measures* showed that the performance of the children with DS in the receptive semantic task was higher than the expressive task [receptive:18.54, expressive: 9.75, F (df 2, 45) = 73.52, $p<.001$].

4. DISCUSSION

Our findings generally showed that children with DS had lower performance in both receptive and expressive semantic tasks than children with TD indicating poor semantic skills in DS, a finding which is in line with previous research in the field (Yoder & Warren, 2004). Their problems in expressive semantics seem to correlate with problems in the receptive semantics proving a general deficit in the semantic domain of language which has also been proved for other language domains in DS (Chapman & Hesketh, 2001; Miller, 1999).

However, when receptive semantic skills were compared to expressive ones their performance was proved much lower in the expressive than the receptive semantics, confirming the continuous problems children with Down syndrome seem to experience in the expressive domain of language (Chapman, 2006; Facon, Facon- Bollengier & Grubar, 2002). The differences found between expressive and receptive language in children with Down syndrome may indicate that receptive vocabulary and general semantics may follow a different developing path than expressive. Moreover, expressive vocabulary in children with typical development seems to develop at a faster rate than in children with Down syndrome proving that difficulties in the linguistic area is still a basic communication problem in this population. The small amount of correct answers given by the DS group in both semantic tasks may also be explained by the requirements of the specific test but basically by the difficulties this specific population experience throughout everyday life.

The findings of this research show the importance of early language intervention as well as the need for special education to focus on language skills in DS and design intervention programs which will be used in order to improve language abilities in DS and especially expressive ones.

However, these results must be treated with caution since our sample was small and it was not followed longitudinally. Moreover, it was compared only to TD children and not to children with other developmental disorders. Therefore, more research studies on DS semantics are needed with larger samples which will be followed from childhood right through adolescence and adulthood and compared to individuals with other developmental disorders.

5. CONCLUSIONS

The results of this study showed that children with DS face difficulties in both receptive and expressive semantics especially when their performance is compared to that of TD children. Their difficulties in expressive semantics seem to correlate with difficulties in receptive semantics. However, when expressive semantic skills are compared to receptive ones they are found much poorer in the children with DS of our sample.

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